

## Curriculum Vitae

**Name:** Dr. Antti Lignell  
**Address:** 4302 Franklin Avenue  
Los Angeles, CA 90027  
United States  
Tel. +1-323-334-5347, Skype: antti.lignell  
**Family:** Spouse: Hanna Lignell (Ph.D. student, UC Irvine), three children  
**Citizenship:** Finnish (European Union), United State Resident since 2008

## Current Position:

Postdoctoral Scientist  
**Affiliation:** Jet Propulsion Laboratory, California Institute of Technology  
Mail Stop 183-301, 4800 Oak Grove Drive,  
Pasadena, CA 91109, USA  
Tel. +1-818-203-3295 (Cell), +1-818-354-2453 (Lab)  
Fax +1-818-393-4445

## Education:

- 08/20/2008 **Doctor of Philosophy** (Ph.D.), Physical Chemistry, University of Helsinki  
“Intermolecular Interactions of Noble-Gas-Containing species”  
Grades: Thesis: Eximia cum Laude Approbatur (7/8), Defence: Excellent  
Supervisors Prof. Markku Räsänen and Dr. Leonid Khriachtchev
- 04/13/2003 **Master of Science** (M.Sc.), Physical Chemistry, University of Helsinki,  
“New Argon and Krypton Compounds and Their Interactions with Surrounding”  
Grade: Eximia cum Laude Approbatur (7/8), Supervisor Prof. Markku Räsänen
- 07/09/1998 **Reserve Officer School**, Finnish Military Forces, 2<sup>nd</sup> Lt. Rank,  
(Military Service Mandatory in Finland)
- 05/31/1996 **Matriculation Exam**, Tampereen Lyseon Lukio High School, Tampere, Finland

## Scientific Employment:

- 10/01/2008-present      **NASA Jet Propulsion Laboratory  
California Institute of Technology,**  
Pasadena CA, United States  
Postdoctoral Scientist, Ice Spectroscopy Lab of  
Dr. Murthy Gudipati
- 07/01/2006-10/01/2008      **Laboratory of Physical Chemistry, University of Helsinki,**  
Helsinki, Finland  
Research Scientist, Center of Excellence project "Computational  
Molecular Science", Academy of Finland
- 01/01/2002-6/30/2006      **Laboratory of Physical Chemistry, University of Helsinki**  
Helsinki, Finland  
Ph.D. Student (Laskemo Graduate School, Ministry of Education,  
Finland) and Teaching Assistant
- 08/01/2000-10/31/2001      **Laboratory of Physical Chemistry, University of Helsinki**  
Helsinki, Finland  
Summer Trainee and Teaching Assistant

## Visiting Positions:

- 05/26/2008-present      **NIST Electron & Optical Physics Division, Gaithersburg MD,  
United States**  
Guest Researcher, Synchrotron Ultraviolet Radiation Facility  
SURF, collaboration between JPL and NIST with Dr. Uwe Arp

## Scientific Positions of Trust:

- **Referee** in international peer-reviewed journals [*Journal of Chemical Physics (AIP)* and *Physical Chemistry Chemical Physics (RSC)*]
- **Member of the local organizing committee** in the 7<sup>th</sup> International Conference on Low Temperature Chemistry, 08/24/2008-08/27/2008, Helsinki, Finland
- **Local organizer** of the 6<sup>th</sup> National FTIR Symposium, 05/12/2008-05/13/2008 Helsinki
- **Conference secretary** in 3<sup>rd</sup> National Meeting of Condensed Phase Spectroscopy and Photochemistry, 11/21/2003, Helsinki, Finland
- **Member of Board** in the Optical Spectroscopy Section of the Association of Finnish Chemical Societies 2006-2008

## Pedagogical Experience:

- **Lecturer** in University of Helsinki Lectures Courses (Laser Chemistry, Introduction to Computational Chemistry)
- **Teaching Assistant** in University of Helsinki Courses
- **Teaching Assistant** in Undergraduate and Graduate laboratory studies in Physical Chemistry, University of Helsinki
- **Developer** of the Undergraduate and Graduate laboratory studies in Physical Chemistry, University of Helsinki
- **Supervisor** of three *M.Sc.* theses in the Laboratory of Physical Chemistry, University of Helsinki
- **Part-time Teacher** of mathematics, physics and chemistry in elementary and high schools
- **Platoon Leader** in the Finnish Military Forces

## Interviews:

11/11/2009 **Magazine Interview:** "From Helsinki to California"  
Chemistry News Journal, Finland

09/30/2008 **Magazine Interview:** "Astrochemist studying ice at the NASA/JPL"  
Luova Magazine, Finland

08/04/2008 **Radio interview:** Radio Voima, morning program, Lahti, Finland

12/2004 **Person of the Month**, *Ksenonit* educational portal by the LUMA center,  
Faculty of Science, University of Helsinki

05/19/2004 **Radio interview:** Finnish National Broadcasting Company (YLE1),  
Science program *Radiaattori* on the topic "Noble-gas chemistry"

## Awards and Major Grants:

10/01/2008-12/31/2010 **Academy of Finland Grant for Research Abroad**  
82300 EUR (~115000 USD)

07/28/2005 **George C. Pimentel Prize for the Best Poster Presentation**,  
Matrix 2005 Conference, Funchal, Madeira, Portugal

01/01/2002-01/01/2006 **Ministry of Education Finland, Laskemo Graduate School**  
**Grant for Ph.D. Studies in the University of Helsinki**  
84000 EUR (~118000 USD)

## **Citation Metrics:**

03/15/2010 Based on 20 Published Articles:

Sum of the Times Cited: 349

Average Citations per Article: 17.45

h-index: 9

## Original Publications in Peer-Reviewed International Journals

1. Leonid Khriachtchev, Mika Pettersson, **Antti Lignell**, and Markku Räsänen  
“A More Stable Configuration of HArF in Solid Argon”  
J. Am. Chem. Soc. **123**, 8610 (2001)
2. Mika Pettersson, Leonid Khriachtchev, **Antti Lignell**, Markku Räsänen, Z. Bihary, and R. B. Gerber  
“HKrF in Solid Krypton”  
J. Chem. Phys. **116**, 2508 (2002)
3. **Antti Lignell**, Leonid Khriachtchev, Mika Pettersson, and Markku Räsänen  
“Large Blueshift of the H-Kr Stretching Frequency of HKrCl upon Complexation with N<sub>2</sub>”  
J. Chem. Phys. **117**, 961 (2002)
4. **Antti Lignell**, Jan Lundell, Mika Pettersson, Leonid Khriachtchev, and Markku Räsänen  
“Kr-Cl Stretching Vibration Mode of HKrCl: Matrix-Isolation and Anharmonic *Ab Initio* Study”  
Low Temp. Phys. **29**, 844 (2003), [originally in Fizika Nizkikh Temperatur **29**, 1109 (2003)]
5. **Antti Lignell**, Leonid Khriachtchev, Mika Pettersson, and Markku Räsänen  
“Complexation of Rare-Gas Containing Molecules with Nitrogen: Matrix-Isolation and *Ab Initio* Study of HArF...N<sub>2</sub>, HKrF...N<sub>2</sub>, and HKrCl...N<sub>2</sub>”  
J. Chem. Phys. **118**, 11120 (2003)
6. **Antti Lignell**, Leonid Khriachtchev, Mika Pettersson, and Markku Räsänen  
“A Study on Stabilization of HHeF Molecule Upon Complexation with Xe Atoms”  
Chem. Phys. Lett. **390**, 256 (2004)
7. Leonid Khriachtchev, **Antti Lignell**, and Markku Räsänen  
“Formation of HArF in Solid Ar Revisited: Are Mobile Vacancies Involved in the Matrix-Site Conversion at 30 K?”  
J. Chem. Phys. **120**, 3353 (2004)
8. Leonid Khriachtchev, **Antti Lignell**, Jonas Juselius, Markku Räsänen, and Elena Savchenko  
“Infrared Absorption Spectrum of Matrix-Isolated Noble-Gas Hydride Molecules: Fingerprints of Specific Interaction and Hindered Rotation”  
J. Chem. Phys. **122**, 014510 (2005)

9. Leonid Khriachtchev, **Antti Lignell**, and Markku Räsänen  
“Neutralization of Solvated Protons and Formation of Noble-Gas Hydride Molecules: Matrix-Isolation Indications of Tunneling Mechanisms?”  
J. Chem. Phys. **123**, 064507 (2005)
10. **Antti Lignell**, Leonid Khriachtchev, Hanna Mustalampi, Toni Nurminen, and Markku Räsänen  
“Interaction of Bihalogen Anions with Nitrogen: Matrix-Isolation Study and First Principle Calculations of the (ClHCl)<sup>-</sup>...N<sub>2</sub> and (BrHBr)<sup>-</sup>...N<sub>2</sub> Complexes”  
Chem. Phys. Lett. **405**, 448 (2005)
11. Jan Lundell, Sławomir Berski, **Antti Lignell**, and Zdzisław Latajka  
“Quantum Chemical Study of the Hydrogen Bonded HXeOH-H<sub>2</sub>O Complex”  
J. Mol. Struct. **790**, 31 (2006)
12. **Antti Lignell**, Leonid Khriachtchev, Hanna Lignell, and Markku Räsänen  
“Protons Solvated in Noble-Gas Matrices: Interaction with Nitrogen. Matrix Isolation Study and First Principle Calculations”  
Phys. Chem. Chem. Phys. **8**, 2457 (2006)
13. Leonid Khriachtchev, **Antti Lignell**, Hanna Tanskanen, Jan Lundell, Harri Kiljunen, and Markku Räsänen  
“Insertion of Noble-Gas Atoms into Cyanoacetylene: *Ab Initio* and Matrix-Isolation Study”  
J. Phys. Chem. A **110**, 11876 (2006)
14. **Antti Lignell**, Leonid Khriachtchev, Jan Lundell, Hanna Tanskanen, and Markku Räsänen  
“On Theoretical Predictions of Noble-Gas Hydrides”  
J. Chem. Phys. **125**, 184514 (2006)
15. Hanna Tanskanen, Susanna Johansson, **Antti Lignell**, Leonid Khriachtchev, and Markku Räsänen  
“Matrix-Isolation and *Ab Initio* Study of the HXeCCH...CO<sub>2</sub> Complex”  
J. Chem. Phys. **127**, 154313 (2007)
16. Hanna Tanskanen, Leonid Khriachtchev, **Antti Lignell**, Markku Räsänen, Susanna Johansson, Ivan Khyzhniy, and Elena Savchenko  
“Formation of Noble-Gas Hydrides and Decay of Solvated Protons Revisited: Diffusion-Controlled Reactions and Hydrogen Atom Losses in Solid Noble Gases”  
Phys. Chem. Chem. Phys. **10**, 692 (2008)

17. Anastasia V. Bochenkova, Leonid Khriachtchev, **Antti Lignell**, Markku Räsänen, Hanna Lignell, Alexander A. Granovsky, and Alexander V. Nemukhin  
“Hindered Rotation of HArF in Solid Argon: Infrared Spectroscopy and a Theoretical Model”  
Phys. Rev. B **77**, 094301 (2008)
18. **Antti Lignell**, Jan Lundell, Leonid Khriachtchev, and Markku Räsänen  
“Experimental and Computational Study of HXeY...HX Complexes (X, Y = Cl and Br): An Example of Exceptionally Large Complexation Effect”  
J. Phys. Chem. A **112**, 5486 (2008)
19. **Antti Lignell** and Leonid Khriachtchev  
“Intermolecular Interactions Involving Noble-Gas Hydrides: Where the Blue Shift of Vibrational Frequency is a Normal Effect”, **Review Article**  
J. Mol. Struct. **889**, 1 (2008)
20. Alice Corani, Alexandra Domanskaya, Leonid Khriachtchev, Markku Räsänen, and **Antti Lignell**  
Matrix-Isolation and *Ab Initio* Study of the HKrCl...HCl Complex  
J. Phys. Chem. A **113**, 10687 (2009)
21. Hanna Lignell, Leonid Khriachtchev, **Antti Lignell**, and Markku Räsänen  
“Local formation of HArF in solid argon: Low-temperature limit and thermal Activation”  
Fizika Nizkikh Temperatur / Low Temp. Phys, In Press
22. Leonid Khriachtchev, Salla Tapio, Markku Räsänen, Alexandra Domanskaya, and **Antti Lignell**  
“HY...N<sub>2</sub> and HXeY...N<sub>2</sub> complexes in solid xenon (Y = Cl and Br): Unexpected suppression of the complex formation for deposition at higher temperature”  
J. Chem. Phys., Submitted
- 23.- A bunch of articles under preparation at the Jet Propulsion Laboratory, California Institute of Technology

## Participation to International Conferences:

1. Euroconference Matrix 2001, The Chemistry and Physics of Matrix Isolated Species  
Szklarska Poreba, Poland, 07/07/2001-07/13/2001  
**Poster presentation**

2. 4<sup>th</sup> International Conference on Low Temperature Chemistry  
Keuruu, Finland, 08/03/2002-08/08/2002  
**Poster presentation**
3. 4<sup>th</sup> International Conference on Cryocrystals and Quantum Crystals  
Freising, Germany, 10/27/2002-10/31/2002  
**Poster presentation**
4. 4<sup>th</sup> Informal Conference on Reaction Kinetics and Atmospheric Chemistry Helsingør,  
Denmark, 06/13/2003-06/15/2003  
**Oral presentation**
5. Gordon Research Conference on Physics and Chemistry of Matrix-Isolated Species  
Lewiston, MA, United States, 07/20/2003-07/25/2003  
**Poster presentation**
6. 3<sup>rd</sup> National Meeting of Condensed Phase Spectroscopy and Photochemistry Helsinki,  
Finland, 11/21/2003  
**Oral presentation**
7. 5<sup>th</sup> Informal Conference on Reaction Kinetics and Atmospheric Chemistry Helsingør,  
Denmark, 06/11/2004-06/13/2004  
**Poster presentation**
8. 5<sup>th</sup> Conference on Cryocrystals and Quantum Crystals  
Wroclaw, Poland 08/29/2004-09/04/2004  
**Poster presentation**
9. 5<sup>th</sup> International Conference on Low Temperature Chemistry  
Berlin-Dahlem, Germany, 10/07/2004-10/10/2004  
**Poster presentation**
10. Matrix 2005, The Physics and Chemistry of Matrix Isolated Species  
Funchal, Madeira, 07/24/2005-07/29/2005  
**Poster presentation (Winner of the Best Poster Prize)**
11. XVIth International Conference on Horizons in Hydrogen Bond Research and Graduate  
School "Hydrogen Bonding and Hydrogen Transfer"  
Roskilde, Denmark, 08/29/2005-09/04/2005  
**Oral and poster presentations**
12. 6<sup>th</sup> International Conference on Low Temperature Chemistry  
Chernogolovka, Moscow region, Russia, 08/27/2006-09/01/2006  
**Poster presentation**



13. 6<sup>th</sup> International Conference on Cryocrystals and Quantum Crystals  
Kharkov, Ukraine, 09/03/2006-09/08/2006  
**Poster presentation**
14. Gordon Research Conference on Physics and Chemistry of Matrix-Isolated Species  
Lewiston MA, United States, 07/15/2007-07/20/2007  
**Poster presentation**
15. XVIIth International Conference on Horizons in Hydrogen Bond Research  
Repino, St. Petersburg region, Russia, 09/01/2007-09/08/2007  
**Poster presentation**
16. 7<sup>th</sup> International Conference on Low Temperature Chemistry  
Helsinki, Finland, 08/24/2008-08/29/2008  
**Oral presentation, Member of the Local Organizing Committee**
17. American Geophysical Union (AGU) 2009 Fall Meeting  
San Francisco, United States, 12/14/2009-12/18/2009  
**Poster presentation**
18. American Chemical Society 2010 Spring Meeting  
San Francisco, United States, 03/21/2010-03/25/2010  
**Poster presentation**